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Correspondence

Can Google® trends predict COVID-19 incidence and help preparedness? The situation in Colombia

Dear Editor

As has been stated by Aschwanden et al. [1], social media and communication can track public interest or concern regarding an infectious disease. The Coronavirus Disease 2019 (COVID-19) has not been the exception. This emerging disease began to cause global concern since it attracted global concern in December 2019 [2], but clearly, in multiple countries the preoccupation was associated with its spreading in other countries in Asia and beyond. This relationship appeared to have a sharp impact especially when COVID-19 cases arrived and increased rapidly in the countries. Here, we would like to show the findings of an assessment regarding the relationship between COVID-19 cases and Google ® searches, using the Google ® Trends tool, in Colombia up to March 28, 2020.

COVID-19 arrived in Latin America on February 25, 2020, to Brazil [3]. Ten days later, the infection made it to Colombia (Fig. 1). Using the Google ® Trends tool (https://trends.google.es/trends/?geo=ES) we found that in Colombia searches on COVID-19 begun on January 21, 2020, as the global situation begun to be a concern. After the first case in the country, the searches started to considerably increase (Fig. 1). There is high relationship after this point between the COVID-19 incidence in Colombia and the Google ® searches on COVID-19 in

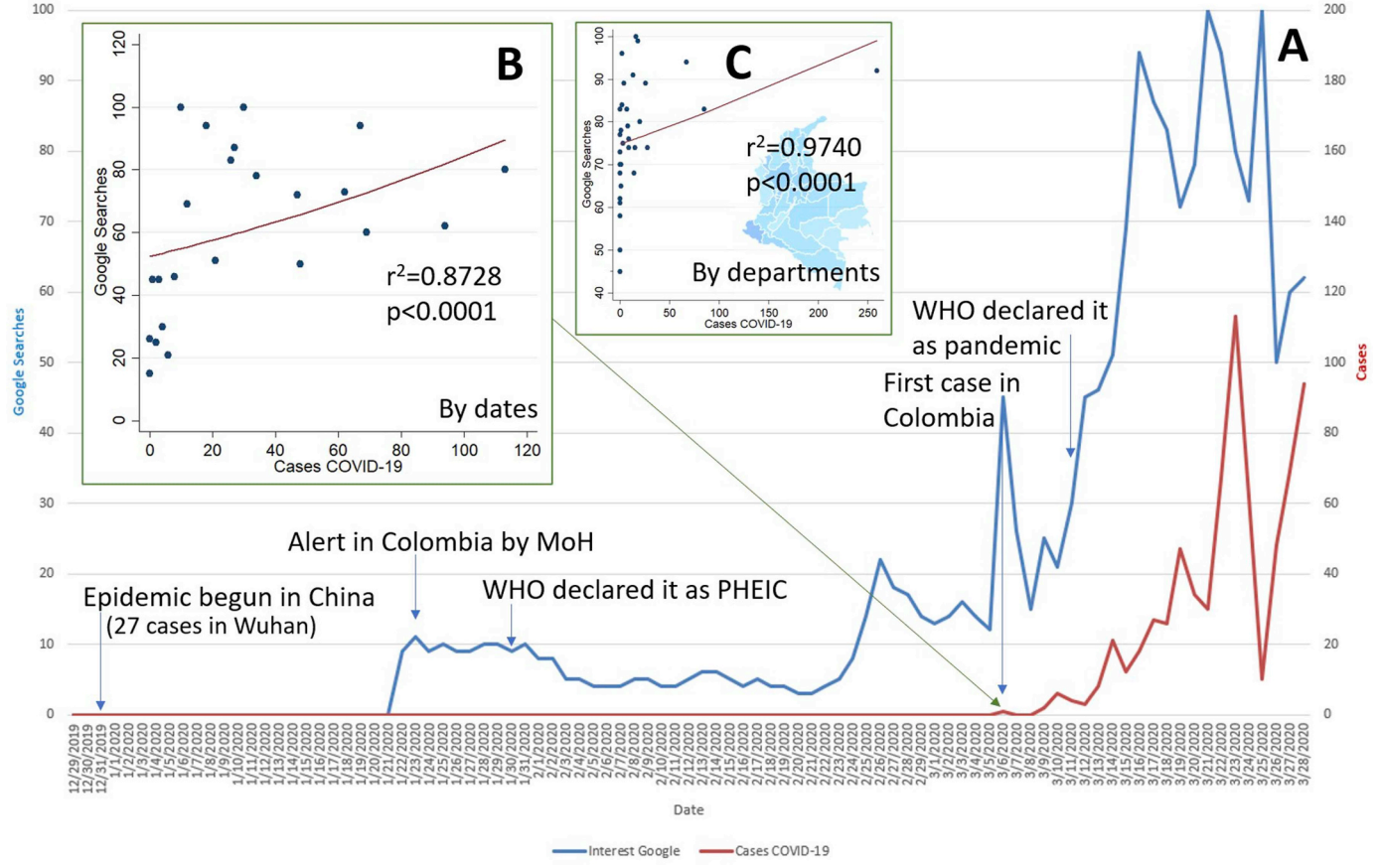

Fig. 1. COVID-19 incidence in Colombia and Google ® searches, December 29, 2019 to March 28, 2020. A. Trends in COVID-19 Cases (red) and Google® searches on COVID-19, in Colombia. B. Non-linear regression between COVID-19 incidence and searches in Colombia, by dates. C. Non-linear regression between COVID-19 incidence and searches in Colombia, by departments. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

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Colombia ($r^2 = 0.8728$, $p < 0.0001$) (Fig. 1). As of March 28, 2020, Colombia confirmed 702 cases of COVID-19 from 10,648 rRT-PCR tests performed (6.6%). At that time, from 32 departments and the capital district, 22 departments reported cases of COVID-19. Looking the searches of COVID-19 by department, they were also highly associated with the number of cases reported at that administrative level ($r^2 = 0.9740$, $p < 0.0001$) (Fig. 1). We ran non-linear regressions, using the best fitted model, on Stata 14IC® licensed for Universidad Tecnologica de Pereira, Colombia, p significant < 0.05. Epidemiological data was obtained from the public web site of the National Institute of Health of Colombia (www.ins.gov.co).

Internet searches and social media data have been reported to correlate with traditional surveillance data and can even predict the outbreak of disease epidemics several days or weeks earlier [4]. A recent study found that searches on COVID-19 correlated with the published data on daily incidence of laboratory-confirmed and suspected cases of COVID-19 in China, with the maximum $r > 0.89$ [4]. Also, in Taiwan, in response to the ongoing outbreak, analyses demonstrated that Google ® Trends could potentially define the proper timing and location for practicing appropriate risk communication strategies to the affected population. Authors found high to moderate correlations between Google® relative search volume and COVID-19 cases by administrative levels, as we did [5]. In Iran, the linear regression model using the Google ® Trends predicted the incidence of COVID-19 [6]. In previous outbreaks due to coronaviruses, such as the SARS and MERS, in 2002 and 2012, different approaches were used to predict outbreaks using social media and Google ® searches.

Despite the studies mentioned above, there is still a lack of publications, on this theme, in Latin America [7], and there are no similar assessments in other countries of the region for COVID-19. We suggest that in countries with lack of diagnostic and surveillance capacity, as is the case of Venezuela and Haiti, the use of Google ® Trends would be used to see changes in the searches related to COVID-19 [3]. As the pandemic of COVID-19 impacted more on the life of people in Colombia, and probably of Latin America, more searches were gradually observed, reflecting the interest of people to be informed about this emerging disease. Up to April 28, 2020 (the date of proofs correction of this letter), Colombia has reported 5,949 cases of COVID-19, with 269 associated deaths.

CRediT authorship contribution statement

Yeimer Ortiz-Martínez: Data curation, Formal analysis, Methodology, Writing - review & editing. **Juan Esteban Garcia-Robledo:** Writing - review & editing. **Danna L. Vásquez-Castañeda:** Writing - review & editing. **D. Katterine Bonilla-Aldana:** Writing - review & editing. **Alfonso J. Rodriguez-Morales:** Conceptualization, Data curation, Formal analysis, Methodology, Software, Writing - original draft, Writing - review & editing.

Declaration of competing interest

We declare that we have no competing interests.

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